

CARD 2/2

Oscillographic Polarograph "Geokhi".

32-8-45/61

of the horizontal amplification. A potentiometer here serves as an amplitude regulator. The electrolytical cell is galvanically connected with the cathode repeater which is regulated by the next alternating resistance. Thus either a positive or a negative voltage can be obtained here which is gauged by tube voltmeters. For measuring the amplitude of the saw-tooth-like voltage there serves the next tube (6) which works as a voltmeter. The voltage is furthermore transmitted by the resistance (19) of the electrolytic cell to an amplifier with tube (7) in the first cascade. All cascades with the exception of end-cascades are fed with the voltage 180 V by the electron stabilizer (tube 16, 17, 18). Tube (19) feeds an electron beam tube (20) which has at the output from the filter the voltage 1800 V. Moreover the apparatus has various additional aggregates which increase its sensitivity. Examples of the application of the apparatus and the exploitation of the results are given here. There are 5 figures, 2 tables,

ASSOCIATION: Institute for Geochemistry and Analytic Chemistry of the Academy of Sciences of the U.S.S.R.
(Institut geokhimii i analiticheskoy khimii Akademii nauk SSSR)

AVAILABLE: Library of Congress.

28(4)

AUTHORS: Gokhshteyn, Ya. P., Volkov, A. F., Kuz'min, S. V., Yanchevskiy, V. A.

SOV/32-25-8-39/44

TITLE: A New Model Oscillographic Polarograph

PERIODICAL: Zavodskaya laboratoriya, 1959, Vol 25, Nr 8, pp 1008-1012 (USSR)

ABSTRACT: A new type cathode-ray polarograph was designed which makes possible the detection of low concentrations of elements and organic compounds, the determination of the capacity of the binary electrical layer on dropping and solid electrodes, the impedance of the electrolytic cell, the velocity and the reversibility of the electrode reactions and the study of surface and adsorption phenomena. The instrument operates with an accuracy of $\pm 2\%$ at concentrations of $10^{-3} - 10^{-5}$ mol/l and of $\pm 3\%$ at $10^{-6} - 10^{-7}$ mol/l. The scheme of the instrument permits a periodical and a unique development of the various fixed velocities of the potential variations and this way both an Hg-dropping electrode and a stationary Hg-electrode can be used and the sensitivity can be considerably increased. One

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A New Model Oscillographic Polarograph

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can operate simultaneously with two cells which are reversed by a polarized relay. The polarographic cell receives simultaneously a constant negative tension and a positive sawtooth-shaped tension which eliminates the deformation of the curves by the current intensity. The radiotechnical wiring of the instrument was designed based on electron-ray tube type 13LO-36 and consists of the following main units (Fig 1): a generator for the linear-varying tension (the potential variations are determined by means of a magneto-electric loop-oscillograph N-10) with a thyatron cathode TG1-0.1/0.3, a compensator for the load resistance of the cell (with a network 12Zh1L) and a compensator of the capacity current, a synchronizer and a single vibrator (6N8) for the delay of the impulse (synchronized with the dropping period of the Hg), an amplifier for the vertical ray declination (with networks 6Zh4, 12Zh1L) and a current feeder unit. The article gives data on the sensitivity (Table) of the instrument and examples of investigations made with oscillograms obtained at the electrolysis of a 1 n KCl-solution, which contained 5.0 γ /ml of Pb^{2+} and Cd^{2+} , and a 1 n HCl-solution containing 0.5 γ /ml of Sb^{3+} and Bi^{3+} and a 1 n KCl-solu-

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A New Model Oscillographic Polarograph

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tion with 0.1 γ /ml of Cd^{2+} . There are 5 figures, 1 table, and 1 Soviet reference.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii Akademii nauk SSSR
(Institute of Geochemistry and Analytical Chemistry of the
Academy of Sciences, USSR)

Card 3/3

KORYAKIN, Sergey Fedorovich, kand. ekon. nauk, dots.; BERNISHTEIN, Iosif L'vovich, kand. ekon. nauk, dots.; Primal uchastnye: FILINSKIY, Yu.F., st. prep.; SHRABSHTEYN, Ye.A., dots., retsenzent; CHERKASOV-TSIBIZOV, A.A., st. prepod., retsenzent; MILYUKOV, M.A., st. prepod., retsenzent; MOZHAROV, N.D., kand. ekon. nauk, retsenzent; MAKAL'SKIY, I.I., kand. ekon. nauk, retsenzent; KREMER, B.A., inzh., retsenzent; PETRUCHIK, V.A., kand. ekon. nauk, red.; GUBERMAN R.L., kand. ekon. nauk, red.; RODIN, Ye.D., kand. ekon. nauk, red.; DUBCHAK, V.Kh., inzh., red.; MARTIROSOV, A.Ye., inzh., red.; PALYUSHKIN, V.A., inzh., red.; BELOV, M.I., doktor geogr. nauk, red.; SINITSYN, M.T., inzh., red.; KOLESNIKOV, V.G., kand. tekhn. nauk, red.; ZAMAKHOVSKIYA, A.G., kand. ekon. nauk, red.; KUZ'MIN, T.P., inzh., red.; NEMCHIKOV, V.I., kand. tekhn. nauk, red.; GEKHTBARG, Ye.A., inzh., red.; FILIPPOV, K.D., red.; KRUGLOVA, Ye.M., red.

[Economics of the merchant marine] Ekonomika morskogo transporta. Izd.2., perer. i dop. Moskva, Transport, 1964.
527 p. (MIRA 18:1)

KUZ'MIN, V.

Third stage. NTO 5 no.4:33-36 Ap '63.

(MIRA 16:3)

1. Spetsial'nyy korrespondent zhurnala "Nauchno-tekhnicheskiye
obshchestva SSSR.

(Moscow Province--State farms)

L 08112-67 EWT(d)/EWT(m)/EWP(f) FDN

ACC NR: AP6030301

(N)

SOURCE CODE: UR/0310/66/000/008/0050/0050

AUTHOR: Kuz'min, V. (Methodologist)

35
B

ORG: Gor'kiy Branch of the Central House for Technology of the Ministry of the MRF
(Gor'kovskiy filial tsentral'kogo doma tekhniki MRF)

TITLE: Campaign to increase the durability and reliability of M-50 engines

SOURCE: Rechnoy transport, no. 8, 1966, 50

TOPIC TAGS: marine engine, diesel engine, hydrofoil, *ENGINE PERFORMANCE CHARACTERISTIC*

ABSTRACT: Competition between the hydrofoils of the Volga River Fleet, powered by M-50 diesel engines, has resulted in technical and maintenance improvements which have decreased the period between repairs over a 5-year period of operation to an average of 1650 hr, i.e., 2000—2500 hr for new engines and 1000—1300 hr for overhauled engines. This could be achieved by maintaining a constant temperature in the engines water and fuel systems, avoiding the overloading of the engine, strictly adhering to a 2.5—3-min period for lifting onto the foils, and turning sharply only when not running on foils. Among new technical developments are mentioned a newly designed nondetachable stern tube, and acoustic and visual cooling water-temperature signaling arrangements. The data showed the Raketa-14 and Meteor-27 hydrofoils to have the best operating characteristics. The straightening of the propeller-blade edges of the latter was performed 3 times during the season and resulted in

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UDC: 621.436.004

L 08112-67

ACC NR: AP6030301

improved operation. Cavitation damage to blades, which was less than 2 mm dupr was not repaired, since it had been found that they influenced the performance very little. Generally, the repair lay-up period could be shortened by four times. [CE]
Orig. art. has: 3 figures.

SUB CODE: 13, 21 / SUBM DATE: none

Card 2/2 net

BORISOV, I., kand. tekhn. nauk; KUZ'MIN, V., kand. tekhn. nauk; REMEZOV,
V., aspirant; BALBEROV, Yu., aspirant

Durable rafts for the Volga-Baltic Sea Waterway. Rech. transp.
24 no.8:22-23 '65. (MIRA 18:9)

1. Gor'kovskiy institut inzhenerov vodnogo transporta.

KUZ'MIN, V., inzh.

Efficiency of towing streamlined rafts. Rech. transp. 23
no.1:16-17 Ja '64. (MIRA 18:11)

KUZ'MIN, V., inzh.; REZNICHENKO, U., inzh.

Floating rafts without accident. Rech. transp. 22 no.6:17-19 Je '63.
(MIRA 16:9)

{Rafts—Handling}

MAKHOTKIN, N.; KUZ'MIN, V., starshiy nauchnyy sotrudnik; ZHIRNOV, Ya.,
starshiy nauchnyy sotrudnik

Development of the shipping of round timber in the Volga-Kama
basin. Rech. transp. 24 no.3:16-17 '65. (MIRA 18:5)

1. Zamestitel' nachal'nika Upravleniya gruzovoy i kommercheskoy
raboty Ministerstva rechnogo flota (for Makhotkin). 2. Gor'kovskiy
institut inzhenerov vodnogo transporta (for Kuz'min, Zhirnov).

CHIRKIN, O., inzh.; KUZ'MIN, V.; BORISOV, L.; ISHKIN, V.; SEREBYANNIKOV, G.

Information. Avt.transp. 42 no.12:52-54 D '64.

(MIRA 18:4)

KUZ'MIN, V., komandir podrazdeleniya

Explorers of the Arctic Region. Grazhd.av. 20 no.5:26 My '63.
(MIRA 16:7)

(Arctic Region) (Aeronautics, Commercial)

KUZ'MIN, V.

Wide possibilities for major industrial chemical complexes.
NTO 5 no.8:12-14 Ag. '63. (MIRA 16:10)

1. Spetsial'nyy korrespondent zhurnala "Nauchno-tekhnicheskiye obshchestva SSSR."

MESHCHANIKOV, B.N.; STRAKHOV, K.I.; LEVIN, Ya.Ye.; BOS'KO, K.P.; KUZ'MIN, V.A.
MELIANTSEY, V.F.; YEFREMOV, A.F.

New method of smelting and pouring oxidizing alloys. Prom. energ. 12
no.3:25 Mr '57. (MIRA 10:6)
(Alloys) (Smelting)

AUTHOR:

Aerov, L.P.
Bas'kov, K.P.
Bovin, V.G.
Georgiyevskiy, P.I.
Ivin, Ya.Ye.
~~Kuz'min V.A.~~
Strakhov, K.I.
Shageyev, Ye. A.

SOV/94-58-11-10/28

TITLE:

The Production of Accurate Castings by the Lost Wax Process with Patterns Made of Composition MAI-KTM-500.
(Proizvodstvo tochnogo lit'ya po vyplavlyayemym modelyam na sukhom napolnitele s primeneniym splava MAI-KTM-500)

PERIODICAL: Promyshlennaya Energetika, 1958, Nr 11, pp 19-21 (USSR)

ABSTRACT:

This article is about a suggestion that was awarded second premium in an All-Union power economy competition. The staff of the works together with the Chair of Metal Technology of the Moscow Aviation Institute developed and introduced the process of accurate casting by the lost wax process using a dry filler for the pattern, composition MAI-KTM-500 instead of the old wet filler.

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SOV/94-58-11-10/28

The Production of Accurate Castings by the Lost Wax Process with Patterns Made of Composition MAI-KTM-500.

The composition previously used for making patterns is given, the new composition consists of 84.5% rosin, 11.8% paraffin wax, 1.0% ceresine, 0.4% bitumen. A variety of different parts that have been produced by this method are illustrated in Figs. 1, 2 and 3. A wider range could be made than previously because the ceramic covers of the moulds are much stronger than before. The new composition can be used repeatedly. The advantages of the new composition over materials of lower and higher melting points are briefly stated. When the composition is melted out of the mould little damage is done because its coefficient of expansion is small. Indeed, the moulds are even strengthened because the composition penetrates into the pores of the ceramic. Especially good results were obtained with the new material in the manufacture of turbine blades as shown in Fig. 4. As a result of introducing

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SOV/94-58-11-10/28

The Production of Accurate Castings by the Lost Wax Process with
Patterns Made of Composition MAI-KTM-500.

the new method of accurate casting, the annual
economy of electric power is more than 2.4 million kWh
and working conditions have been improved. There are
4 figures.

Card 3/3

KUZ'MIN, V.A.

BUKOV, V.A., BYKOV, L.A., VALUK, V.A., VARTBARONOV, R.A., ZHILIS, E.F.,
KONDRAKOV, V.M., KUZ'MIN, V.A., SYCHEV, G.I. PROLOV, N.I.,
POKIN, A.S., KHARINSKIY, A.N. (Saratov)

New method for producing stable neurogenic hypertension in dogs
[with summary in English]. Arkh.pat. 20 no.5:21-27 '58 (MIRA 11:6)
(HEART, anatomy and histology,
thebesian vessels, review (Rus))

KUZ'MIN, V.A.

KACHKOVSKIY, M.A., starshiy nauchnyy sotrudnik; KUZ'MIN, V.A.

Method of making electrodes for radical physical therapy. Vest. ven.
i derm. no.1:46 Ja-F '55. (MLRA 8:4)

1. Iz nauchno-issledovatel'skogo kozhno-venerologicheskogo instituta
Ministerstva zdravookhraneniya RSFSR.
(ELECTRODES, GLASS) (DERMATOLOGY) (ELECTROSURGERY)

KUZ'MIN, V.A. (Penza)

Method of exercise therapy in lesions of the facial nerve. Zhur.
nevr. i psikh. 56 no.4:342-343 '56. (MLRA 9:7)
(NERVES, FACIAL, paralysis,
ther., exercise (Rus))
(EXERCISE THERAPY, in various diseases,
facial paralysis (Rus))
(PARALYSIS,
facial, ther., exercise (Rus))

USSR / Soil Science. Physical and Chemical Properties of Soils. J

Abs Jour: Ref Zhur-Biol., No 21, 1958, 95688.

Author : Kuz'min, V. A.
Inst : Eastern Branch AS USSR - Irkutsk University.
Title : Experimental Investigation of "Organic Coments"
in the Aggregates of Virgin and Arable Soils of
Irkutskaya Oblast.

Orig Pub: Izv. vost. fil. AN SSSR, 1957, No 1, 130-136.

Abstract: The composition of humus substances of old arable and virgin turf-carbonate and dark-gray soils was studied by means of a three-fold treatment with a buffer mixture of sodium oxalic acid with NaOH. After the first treatment, there occurs an extraction of a significant quantity of the humus substances and a decomposition of the aggregates

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KUZ'MIN, V.A.

Group formation of microaggregates in certain soils of Irkutsk
Province. Trudy Vost.-Sib.fil.AN SSSR no.17:103-125 '59.
(MIRA 13:8)

(Irkutsk Province--Soils)

KUZ'MIN, V. A., CAND BIO SCI, "STRUCTURE OF ^{*the grey*} WOODED
^{*turfy-carbonate*} AND ~~DERM-CALCAREOUS~~ SOILS OF IRKUTSKAYA OBLAST." IR-
KUTSK, 1960. (MIN OF HIGHER AND SEC SPEC ED RSFSR,
IRKUTSK STATE UNIV IM A. A. ZHDANOV, CHAIR OF SOIL
SCIENCE). (KL, 3-61, 210).

KUZ'MIN, V.A.

Soils of the northern Oka-Angara interfluvium. Izv.Sib.otd.AN SSSR
no.4:97-109 '61. (MIRA 14:6)

1. Vostochno-Sibirskiy filial Sibirskogo otdeleniya AN SSSR,
Irkutsk.

(Angara Valley—Soils)

KUZ'MIN, V.A.

Occurrence of salinized soils under forests. Pochvovedenie
no.1:111-114. Ja '62. (MIRA 17:1)

1. Institut geografii Sibiri i Dal'nego Vostoka AN SSSR.

3C

L 23008-66. FSS-2/ET(1)/ET(m)/ETC(f)/EWG(m) JD/HW

ACC NR: AP6007662

SOURCE CODE: UR/0413/66/000/003/0031/0031

AUTHOR: Rozovskiy, V. M.; Fisher, T. L.; Basharina, Yu. I.; Chebakova, N. A. Kuz'min, V. A.; Maklyarskaya, A. A.; Avdeyeva, I. D.; Gavriliina, L. V.

51
B

ORG: none

TITLE: Iron-nickel alkaline battery.²⁷ Class 21, No. 178401 [announced by the Scientific-Research Institute for Chemical Current (Nauchno-issledovatel'skiy institut khimicheskikh istochnikov toka)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 3, 1966, 31

TOPIC TAGS: battery, alkaline cell

ABSTRACT: An Author Certificate has been issued for an iron-nickel alkaline battery with lamellar-perforated electrodes of which the negative one is made from hydrogen-reduced iron. In order to increase the capacity at low temperatures and after prolonged discharge, the active mass of the iron electrode is supplemented with additions of antimony oxide and sulfide sulfur. The additions range from 2--4% for antimony oxide and 0.4--0.6% for sulfide sulfur. The iron electrode is

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UDC: 621.355.8

2

L 23008-66

ACC NR: AP6007662

produced in the form of lamellar tape with 16 to 18% open surface.

0
[LD]

SUB CODE: 10/

SUBM DATE: 13Aug64/

Card 2/2 *pla*

POPOV, Aleksandr Nikolayevich; KRIVTSOV, V.I., red.; KUZ'MIN, V.A., red.;
SHILLING, V.A., red. izd-va; BELOGUROVA, I.A., ~~tekh.~~ red.

[New building materials in industrial and public construction]
Novye stroitel'nye materialy v promyshlennom i grazhdanskom
stroitel'stve; stenogramma lektsii. Leningrad, Leningr. Dom
nauchno-tekh. propagandy, 1961. 8 p. (MIRA 14:7)
(Building materials)

BERSHIDSKIY, Abram Khaimovich, kand. tekhn. nauk; BABKOV, Nikolay Konstantinovich, inzh.; KUZ'MIN, V.A., red.; BELOGUROVA, I.A., tekhn. red.

[New developments in production planning of housing construction]
Novoe v proizvodstvennom planirovanii zhilishchnogo stroitel'stva;
stenogramma lektsii. Leningrad, 1961. 26 p. (MIRA 14:7)
(Construction industry)

KRAVCHENKO, V.I.; KUZ'MIN, V.A.

Technical and economic indices of the construction of mooring structures
at the Leningrad Commercial Seaport. Transp. stroi. 14 no.7:35-36 J1
'64. (MIRA 18.1)

1. Glavnyy inzh. Sevzapmorgidrostrova (for Kravchenko). 2. Nachal'nik
Nauchno-issledovatel'skoy stantsii No.3 Orgtransstroya (for Kuz'min).

[illegible]

COMMON ELEMENTS		PROCESS AND PROPERTIES INDEX		COMMON VARIANTS INDEX	
KUZMIN, V. A.		BC		A-3	
<p>Reaction between (A) phenyl α-dibromo-β-phorylalkyl ketone and sodium, (B) phenyl α-dibromo-β-α-nitrophenylalkyl ketone and sodium azide. V. A. KUZMIN and R. I. FOMIN (Mem. Inst. Chem. USSR Acad. Sci., 1946, 2, 183-190, 191-194).—(A) Na, and $\text{CH}_3\text{Br}-\text{CHBr}-\text{COPh}$ in aq. CO_2, (12 hr. at 65-67°) yield a Br-containing oil, and a monoxide of Ph styryl ketone, m.p. 64-65°, both decomposed by H_2SO_4 with evolution of N_2. (B) $\alpha\text{-NO}_2\text{-C}_6\text{H}_4\text{-CHBr-CHBr-COPh}$ and Na, in aq. NaOH or CO_2, (12-16 hr. at 65-70°) afford a monoxide, m.p. 76-77° (decomp.) of Ph 3-nitro-styryl ketone. R. T.</p>					
ASB-3LA METALLURGICAL LITERATURE CLASSIFICATION					
SOURCE NO.		SOURCE NO. ONLY		SOURCE NO. ONLY	
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
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COMMON ELEMENTS		PROCEDURES AND PROPERTIES INDEX	
KUZMIN, V. N.		2-3	
BC		<p>Analysis of acetylenic hydrocarbons. V. A. Kuzmin and G. G. Filizov (Mosc. Inst. Chem. Univ., Mosc. Inst. Chem. 1955, 2, 68-70).—C₁₀H₈O-C₁₀H₈Cl (II) and NaCl in CCl₄ at 60°C. as the b.p. yield C₁₀H₈O-C₁₀H₈Cl, m.p. 107-108° (decolor., m.p. 107- 108°; of colorless, m.p. 107° (decolor.), not decomposed by H₂O. By using C₁₀H₈O-C₁₀H₈Cl in place of (II), an unstable oil, probably containing C₁₀H₈O-C₁₀H₈N, is obtained. R. T.</p>	
ASACLA METALLURGICAL LITERATURE CLASSIFICATION			
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SACACLA METALLURGICAL LITERATURE CLASSIFICATION		SACACLA METALLURGICAL LITERATURE CLASSIFICATION	

Investigation of use of labeled atoms of the reaction
mechanism of the oxidation of m-aminophenol. J. L. Anderson
J. Org. Chem. 25, 1234 (1960)

"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000928020

DISKING TO FILM, WHICH WAS OBTAINED FROM THE U.S. BY
the assessment of the activity of the thus obtained formulae.

APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000928020C

88442

Angular Distributions of High-energy Muons in the Atmosphere and Their Production Mechanism S/056/60/039/006/034/063 B006/B063

muon produced by the latter travel along a common straight line. The path length x is measured in nucleon mean free paths λ_0 ($\lambda_0 = 75 \text{ g/cm}^2$), and its origin is at the point where the initial nucleon enters the atmosphere. The production spectrum is assumed to be exponential, i.e., the production intensity for an η -meson (π or K) is assumed to be given by $I_0^{(\eta)} E^{-(\gamma+1)} e^{-\mu x}$, and the depth dependence is an exponential function of the absorption coefficient μ which is independent of energy, depth, and angle of inclination of the trajectory. In addition, the mean free path of the η -particles is supposed to be equal to the nucleon mean free path, and that regeneration of the η -particles may be neglected. One obtains the kinetic equation $\partial P^{(\eta)}(x, E) / \partial x = -[1 + E_{\eta}(\theta) / x E] P^{(\eta)}(x, E) + I_0^{(\eta)} E^{-(\gamma+1)} e^{-\mu x}$, and its solution, i.e., the expression for the flux of η -mesons of energy E at a depth x reads

$$P^{(\eta)}(x, E) = e^{-x} \sum_{i=1}^{\infty} \frac{x^i}{i!} F_i^{(\eta)}(E); F_i^{(\eta)}(E) = I_0^{(\eta)} a^{i-1} E^{-(\gamma+1)} [1 + E_{\eta}(\theta) / i E]^{-1},$$

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Angular Distributions of High-energy Muons in S/056/60/039/006/034/063
the Atmosphere and Their Production Mechanism B006/B063

where $a = 1 - \mu$. $E_\gamma(\theta)$ is the critical energy at which the probability of η -meson decay on the path $x=1$ is equal to the nuclear collision probability. The kinetic equation for the muons in the atmosphere reads

$$\frac{\partial P^{(\mu)}(x, E, \theta)}{\partial x} = - \frac{mc\lambda_0}{\tau_{0\mu} \rho(x, \theta) E} P^{(\mu)}(x, E, \theta) + \frac{\partial}{\partial E} [\beta(E) P^{(\mu)}(x, E, \theta)] + G(x, E, \theta),$$

where m , $\tau_{0\mu}$ are the muon mass and lifetime, respectively; $\beta(E)$ are the muon energy losses per unit path. Muon decay, energy losses, and generation are taken into account by the first, second, and third term, respectively. Considering that $P^{(\mu)}(0, E, \theta) = 0$, its solution reads

$$P^{(\mu)}(x, E, \theta) = \exp\{-v(x, E, \theta) + c\lambda_0 x\} \int_0^x G(t, \varepsilon(E, x-t)) \exp\{v(t, E, \theta) - c\lambda_0 t\} dt, \text{ where}$$

$$v(x, E, \theta) = (mc\lambda_0 / \tau_{0\mu}) \int_{x_0}^x dt / \rho(t, \theta) \varepsilon(E, x-t) \text{ and } \varepsilon(E, x-t) = E \exp(c\lambda_0(x-t))$$

+ $(\beta_0/c) \{ \exp(c\lambda_0(x-t)) - 1 \}$. The energy of the muon x_0 is a constant which

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Angular Distributions of High-energy Muons
in the Atmosphere and Their Production
Mechanism

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S/056/60/039/006/034/063
B006/B063

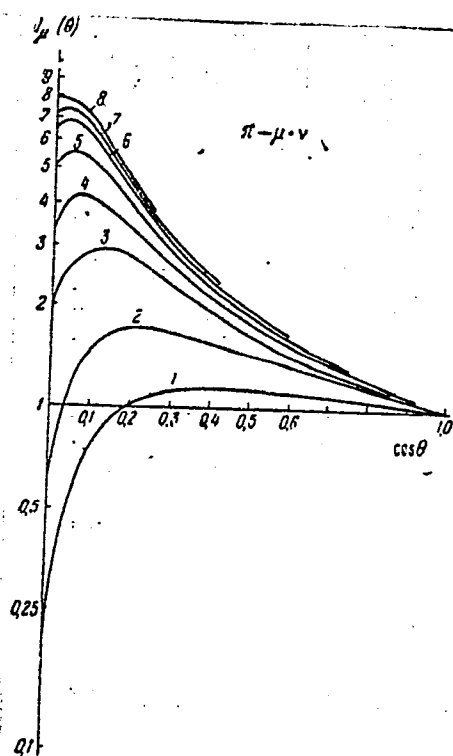
may be set equal to 1. Finally, the muon source function $G(x, \varepsilon)$ is studied, and the angular distributions for muons with an energy of $10^{11} - 10^{14}$ ev are numerically calculated and graphically represented in Fig.1. It has been shown that in the energy range of $10^{11} - 5 \cdot 10^{12}$ ev, the muon angular distribution is essentially dependent on the production mechanism. P. P. Alekseyev and I. S. Alekseyev are mentioned. There are 2 figures, 3 tables, and 11 references: 8 Soviet, 1 US, and 1 Italian.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
(Institute of Physics imeni P. N. Lebedev, Academy of
Sciences USSR)

SUBMITTED: June 10, 1960

Card 4/6

88442

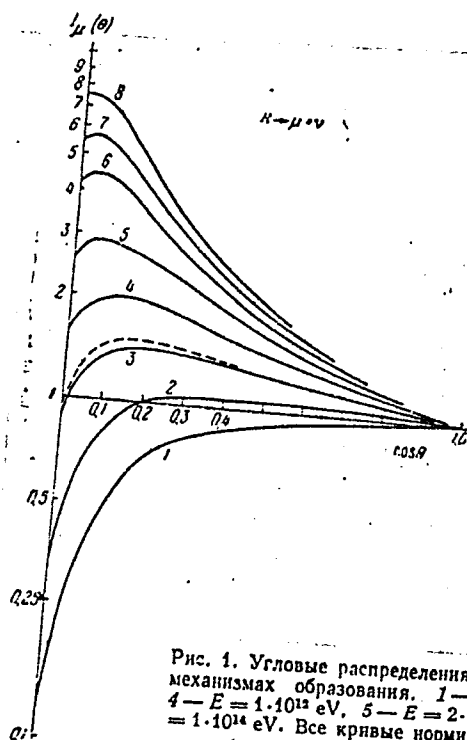


S/056/60/039/006/034/063
B006/B063

Fig. 1
(CONT. ON NEXT CARD)

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B006/B063

Рис. 1. Угловые распределения μ -мезонов различной энергии E в атмосфере при двух механизмах образования. 1— $E = 1 \cdot 10^{11}$ eV, 2— $E = 2 \cdot 10^{11}$ eV, 3— $E = 5 \cdot 10^{11}$ eV, 4— $E = 1 \cdot 10^{12}$ eV, 5— $E = 2 \cdot 10^{12}$ eV, 6— $E = 5 \cdot 10^{12}$ eV, 7— $E = 1 \cdot 10^{13}$ eV, 8— $E = 1 \cdot 10^{14}$ eV. Все кривые нормированы к соответствующей интенсивности в вертикальном направлении.

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KUZMIN, V.A., ZATSEPIN, G.T.,

"Neutrinos in Cosmic Rays and Possible types of
Related Experiments,"

report presented at the Intl. Conference on Cosmic Rays and
Earth Storms, Kyoto, Japan, 4-15 Sept 1961.

31778
S/056/61/041/006/024/054
B102/B138

24.6610

AUTHORS: Zatsepin, G. T., Kuz'min, V. A.

TITLE: Generation of a neutrino in the atmosphere

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41,
no. 6(12), 1961, 1818-1827

TEXT: Calculations are given for the energy and angular distributions of neutrinos produced in the atmosphere in the decays $\pi \rightarrow \mu + \nu$ and $\mu \rightarrow e + \nu + \bar{\nu}$. The neutrino spectra were calculated with allowance for muon energy losses and angular distributions of neutrino fluxes in the atmosphere. Assuming that all secondary particles have the same direction of flight as the primary ones, the problem may be regarded as one-dimensional. In this approximation the neutrino spectrum from muon decay at a depth x in the atmosphere and at an angle θ to the vertical is given by

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Generation of a neutrino in the ...

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S/056/61/041/006/024/054
B102/B138

$$P_{\pi}^{\nu}(x, e, \theta) = (1 - e^{-x}) F^{\nu}(e, \theta) \approx \frac{I_{\pi} A_{\pi\nu} e^{-(\gamma+1)}}{1 + 3.28 e/E_{\pi}(\theta)} (1 - e^{-x}). \quad (3)$$

$$F^{\nu}(e, \theta) = \frac{I_{\pi}}{1 - m^2/M^2} \int_{e(1-m^2/M^2)^{-1}}^{\infty} \frac{E^{-(\gamma+1)} dE}{1 + E/E_{\pi}(\theta)}, \quad A_{\pi\nu} = \frac{1}{1 + \gamma} \left(1 - \frac{m^2}{M^2}\right)^{\gamma}.$$

e being neutrino energy, m and M are muon and pion mass, resp., I_{π} is the intensity of pion generation at $E=1$ (energies are given in BeV), γ - the exponent of the integral spectrum of pion generation, $E_{\pi}(\theta)$ - critical pion energy at which the pion decay probability at $x=1$ equals the probability of nuclear interaction. At sea level and vertical flux,

$$P_{\pi}^{\nu}(e, 0) d\theta = \begin{cases} 1.85 \cdot 10^{-3} (0.08 + e)^{-2.80} de, & 1 \leq e \leq 10 \\ 6.65 \cdot 10^{-3} (1.1 + e)^{-2.32} de, & 10 \leq e \leq 300 \end{cases} \quad (4).$$

The total flux of neutrinos with more than 1 BeV was found to be $8.9 \cdot 10^{-3} \text{ cm}^{-2} \text{ sec}^{-1} \text{ steradian}^{-1}$. This is more than double the value found by I. M. Zhelenykh and M. A. Markov (Preprint OIYaI, 1960; Nucl. Phys., Card 2/7

Generation of a neutrino in the ...

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S/056/61/041/006/024/054
B102/B138

printing). For neutrinos produced in muon decay

$$P_{\mu}^{\nu}(x, \varepsilon, \theta) = \int_0^{\infty} P_{\mu}^{\nu}(x, E, \theta) R_{\mu\nu}(E, \varepsilon) dE, \quad (7)$$

$$P_{\mu}^{\nu}(x, E, \theta) = \int_0^x [l_{\mu}(E) \rho(t, \theta)]^{-1} P^{\nu}(t, E, \theta) dt \quad (8)$$

is found. The total muon spectrum for $E \sim 10^{11}$ ev is given by

$$P^{\nu}(x, E, \theta) = \quad (9)$$

$$= I_{\mu} A_{\mu\nu} E^{-(\gamma+1)} \int_0^x e^{u-t} \left[1 + \frac{\beta}{E} (x-t) \right]^{-(\gamma+1)} \left\{ 1 + \frac{1.22E}{E_{\pi}(\theta)} \left[1 + \frac{\beta}{E} (x-t) \right] \right\}^{-1} dt.$$

with

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Generation of a neutrino in the ...

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$$A_{np} = \frac{1 - (m/M)^{2(\gamma+1)}}{(1+\gamma)(1-m^2/M^2)} \quad (9a).$$

$$u = \frac{mc}{\tau_{\mu}} \int \frac{dz}{p(z, \theta) [E + \beta(x-z)]},$$

β denotes muon energy losses to ionization, per unit of path length. The spectrum of the muon decay neutrinos is

$$P_{\mu}^{\nu}(e, 0) ds = \begin{cases} 7.65 \cdot 10^{-3} (0.37 + e)^{-2.78} ds, & 1 \leq e \leq 10 \\ 1.48 (3.5 + e)^{-2.51} ds, & 10 \leq e \leq 100 \end{cases} \quad (11),$$

the value for energies > 1 Bev is $P_{\mu}^{\nu}(> 1.0) = 1.17 \cdot 10^{-2} \text{ cm}^{-2} \text{ sec}^{-1} \text{ steradian}^{-1}$, the total neutrino spectrum is

$$P^{\nu}(e, 0) ds = \begin{cases} 6.0 \cdot 10^{-3} (0.45 + e)^{-2.18} ds, & 1 \leq e \leq 10 \\ 0.12 (0.9 + e)^{-2.24} ds, & 10 \leq e \leq 300. \end{cases} \quad (12)$$

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S/056/61/041/006/024/054

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Generation of a neutrino in the ...

and $P^{\nu}(>1.0) = 2.06 \cdot 10^{-2} \text{ cm}^{-2} \text{ sec}^{-1} \text{ steradian}^{-1}$. Allowance for polarization increases, the intensity of muon decay neutrinos by $\sim 5\%$. Muon energy losses have only a weak effect on neutrino production. The spectra were

normalized using earlier experimental values.

For $I_{\pi} = 0.159 \text{ cm}^{-2} \text{ sec}^{-1} \text{ sterad}^{-1} \text{ BeV}^{-1}$ and $\gamma = 1.62$ the calculated muon spectrum agreed with experimental values in the energy range $10^9 - 10^{12} \text{ ev}$. The neutrino fluxes in the atmosphere are anisotropically distributed;

anisotropy, $P^{\nu}(\epsilon, \pi/2)/P^{\nu}(\epsilon, 0)$, increases with neutrino energy. It tends to 10 for pion decay and to $10L(x, x_{\text{eff}}, \pi/2)/L(x, x_{\text{eff}}, 0)$ for muon decay at

$\epsilon \gg 10^{12} \text{ ev}$. The inaccuracies in the results are due to the ambiguity of the K-meson contribution to neutrino flux, although it is higher than that of pions. The total vertical neutrino flux with $>1 \text{ BeV}$ is five times as high as estimated by Zhelezin and Markov, who only considered pion decay. An experimental arrangement (Fig. 5) is proposed for recording high-energy cosmic neutrinos. It consists of three mosaic layers of scintillation counters (1,2,3) which record the muon path. The absorbers (a) are used

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Generation of a neutrino in the ...

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S/056/61/041/006/024/054
B102/B138

for determination of the threshold energy. Yu. S. Kopysov and V. A. Kuz'min are mentioned. There are 5 figures and 15 references: 9 Soviet and 6 non-Soviet. The four most recent references to English-language publications read as follows: F. Ashton et al., Nature, 185, 364, 1960; J. Duthie et al., Preprint, 1961; Y. Yamaguchi. Prog. Theor. Phys., 23, 1117, 1960; M. A. Markov, I. M. Zheleznykh. Nucl. Phys., in print.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
(Physics Institute imeni P. N. Lebedev of the Academy of
Sciences, USSR)

SUBMITTED: March 8, 1961

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Generation of a neutrino in the ...

31778
S/056/61/041/006/024/054
B102/B138

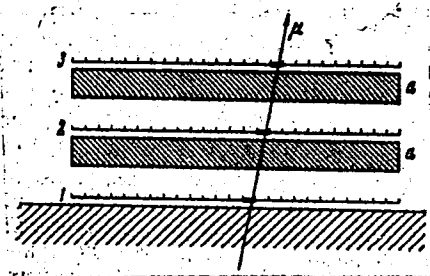


FIG. 5

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S/048/62/026/006/009/020
B125/B102

AUTHORS: Zheleznykh, I. M., Zatsepin, G. T., Kuz'min, V. A.,
and Markov, M. A.

TITLE: Neutrino physics of high energies in cosmic rays

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya,
v. 26, no. 6, 1962, 738-741

TEXT: Some possibilities of neutrino physics in cosmic radiation are evaluated. The energy spectrum and angular distribution of the products (e.g. muons) of cosmic neutrino reactions with matter can be calculated accurately. The low intensity of the neutrino flux necessitates using large-area measuring equipment, e.g. several series of scintillators.

Muons may result from the reaction

$$(a) \nu + n \rightarrow p + \mu^{-}(e^{-}),$$

$$(b) \bar{\nu} + p \rightarrow n + \mu^{+}(e^{+}),$$

$$(c) \bar{\nu} + n \rightarrow \Sigma^{-} + \mu^{+}(e^{+}),$$

$$(d) \bar{\nu} + p \rightarrow \Sigma^{0} + \mu^{+}(e^{+}),$$

$$(e) \bar{\nu} + p \rightarrow \Lambda^{0} + \mu^{+}(e^{+}).$$

(1).

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Neutrino physics of high energies ...

S/048/62/026/006/009/020
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In the case of point interaction, the reaction (1a) has the cross section $\sigma_{\nu} \approx 1.5 \cdot 10^{-38} E_{\nu} \text{ cm}^2$ and $\sigma_{\nu} \approx 0.5 \cdot 10^{-38} E_{\nu} \text{ cm}^2$ (E in Bev) holds for (1,b,c,d,e). When the energies increase to above the Bev range, the cross sections are modified by a form factor. The four-fermion interaction involving baryons and also total interaction can be cut off by the Hofstadter form factor. In this case, weak interactions could supply information as to the usual electromagnetic form factors of the nucleon. If, using the laboratory system, the cross section of the $\nu + N \rightarrow N' + \mu$ -type reaction is not cut off up to neutrino energies of $E_{\nu} = 300 \text{ Bev}$, an apparatus with an active area of 300 m^2 is capable of recording annually 70, 50 and 30 muons at thresholds of 0.5, 1 and 3 Bev, respectively. In the case of cutting off with the Hofstadter form factor, 12, 9 and 3.5 events are recorded annually at thresholds of 0.5, 1 and 3 Bev, respectively. In connection with the possible existence of an intermediate boson, reactions of the type

$$\nu + Z \rightarrow W + \mu + Z', \quad \bar{\nu} + Z \rightarrow W + \mu + Z', \quad (4),$$

$$\bar{\nu} + e^- \rightarrow W \rightarrow \mu^- + \bar{\nu}, \quad (5),$$

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Neutrino physics of high energies ...

S/048/62/026/006/009/020
B125/B102

$$\nu + n \rightarrow W' \rightarrow p + \mu$$

(6)

$$\bar{\nu} + p \rightarrow W' \rightarrow n + \mu$$

are of interest. When the neutrinos ν_μ and ν_e are of different natures, the reaction (5) can be due only to ν_e neutrinos from muon decay. The result obtained by J. C. Barton (Phys. Rev. Lettrs. 5, 514, 1960) furnishes no proof for the absence of an intermediate boson with the mass of the K-particle. In the first stage of a subterranean experiment the muons produced during the reactions (1) will be recorded, as electrons are much more difficult to record. There are 3 figures.

Card 3/3

KUZ'MIN, V.A.

Physics school at Nor-Amberd. Vest. AN SSSR 33 no.7:110 J1
'63. (MIRA 16:8)
(Nor-Amberd--Physics--Study and teaching)

ZATSEPIN, G.T., doktor fiz.-matem.nauk; KUZ'MIN, V.A.

Some problems in neutrino physics. Vest. AN SSSR 34 no. 2:
50-55 F '64. (MIRA 17:5)

L 4469-66 EWT(1)/EWT(m)/T/EWA(m)-2 GW

ACC NR: AP5024649

SOURCE CODE: UR/0048/65/029/009/1743/1745

AUTHOR: Kuz'min, V.A.

23

ORG: none

B

TITLE: Neutrino emission and thermometry of the solar interior /Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964/

SOURCE: AM SSSR, Izvestiya. Seriya fizicheskaya, v. 29, no. 9, 1965, 1743-1745

TOPIC TAGS: sun, neutrino, solar temperature, nuclear reaction

ABSTRACT: It is pointed out that observation of solar neutrinos could provide information not otherwise obtainable concerning the interior of the sun, and it is shown with the aid of a simplified solar model how the internal temperature of the sun could be derived from such observations. The responses of Cl^{37} , Ga^{71} , and Br^{79} neutrino detectors to solar neutrinos arising from different reactions were calculated as functions of the internal temperature of the sun, and the results are presented graphically. These calculations appear to have been based on one of the solar models of R.L. Sears and collaborators (Astrophys. J., 137, 344, 1963; 140, 477, 1964). The Ga^{71} detector is the most sensitive of the three discussed but the responses of the other two detectors are more strongly temperature dependent in the range $(12-20) \times 10^6$ °K. Orig. art. has: 3 formulas and 3 figures.

SUB CODE: NP, AA/ SUBM DATE: 00/

ORIG REF: 001/ OTH REF: 005

Card 1/1

07010381

L 4482-66 EWT(m)/FCC IJP(c)

ACC NR: AP5024651

SOURCE CODE: UR/0048/65/029/009/1749/1750

AUTHOR: Kuz'min, V.A.; Usanova, R.V.

ORG: none

TITLE: Directional and energy distributions of muons produced underground by neutrinos /Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, No. 9, 1965, 1749-1750

TOPIC TAGS: secondary cosmic ray, neutrino, muon

ABSTRACT: The energy and angular distributions of muons produced deep underground by cosmic ray neutrinos have been calculated and the results are presented graphically. The energy spectrum and angular distribution of high energy atmospheric neutrinos given by G.T. Zatsepin and V.A. Kuz'min (Zh. eksperim. i teor. fiz., 41, 1818 (1961)) were employed in the calculations, and it was assumed that the cross section for muon production by interaction of neutrinos (antineutrinos) with protons (neutrons) is proportional to the neutrino energy for energies up to 100 BeV. The muon flux is maximum in the horizontal direction and the anisotropy (ratio of the horizontal to the vertical flux) increases with increasing muon energy and reaches 2 for 10 BeV muons. The calculated muon fluxes are of the order of 10^{-14} muons/cm² sec sterad BeV for 1 BeV

Card 1/2

09010354

L 4482-66

ACC NR: AP5024651

muons and 10-15, muons/cm² sec sterad BeV for 10 BeV muons. Orig. art. has: 2 figures.

SUB CODE: NP/ SUBM DATE: 00/ ORIG REF: 001/ OTH REF: 000

SC
Card 2/2

L 11823-66 EWT(1)/EWT(m)/T/EWA(m)-2 GW

ACC NR: AP6002689

SOURCE CODE: UR/C033/65/042/006/1228/1231

AUTHOR: Kuz'min, V. A.

ORG: Institute of Physics im. Lebedev, Academy of Sciences SSSR (Fizicheskii institut Akademii nauk SSSR)

TITLE: On the neutrino generation in the interior of the sun

SOURCE: Astronomicheskii zhurnal, v. 42, no. 6, 1965, 1228-1231

TOPIC TAGS: neutrino generation, neutrino flux, inner solar structure, solar model

ABSTRACT: The generation of neutrinos in the interior of the sun is described by the reaction $\text{He}^3(p, e^+\nu)\text{He}^4$. A formula is developed which expresses the neutrino flux from one grain of matter in one second. A great quantity of energy is released during the above reaction. According to the Sears model, the intensity of the neutrino flux on earth is $1.3 \cdot 10^6 \text{ cm}^{-2} \text{ sec}^{-1}$; this is markedly less than the intensity of B^8 neutrino flux. The inner structure of the sun can be estimated by the sources of neutrino generation. B^8 neutrinos are generated in a limited small inner region of the sun, while the neutrinos generated in the reaction $\text{He}^3(p, e^+\nu)$ are produced in large regions of the sun. The maximum of (He^3, p) neutrino generation occurs at $0.08 R_\odot$ from the center of the sun, where the temperature is low enough for the reaction $\text{He}^3(p, e^+\nu)\text{He}^4$. Data on the nature of the neutrino must be improved for the study of the inner structure of the sun. These data depend upon the solar

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UDC: 523.72.001

L 11823-66

ACC NR: AP6002689

model used. It is more convenient to study B^8 neutrinos and (He^3, p) neutrinos separately because of their different regions of generation. Such studies should uncover the properties of the inner structure and the physical state of solar layers. Orig. art. has: 1 table, 3 figures, and 3 formulas. [EG]

SUB CODE: 03/ SUBM DATE: 11May65/ ORIG REF: 005/ OTH REF: 012/ ATD PRESS: 4/28

HW
Card 2/2

L 12146-66 EWT(1)/EWT(m)/EWA(h) GW

ACC NR: AP6000211

SOURCE CODE: UR/0056/65/049/005/1532/1534

AUTHOR: Kuz'min, V. A. 44.5

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskii institut Akademii nauk SSSR)

TITLE: Detection of solar neutrinos with the aid of the reaction $\text{Ga}^{71}(\nu, e^-)\text{Ga}^{71}$ 19 44.5

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 5, 1965, 1532-1534

TOPIC TAGS: neutrino, cosmic ray effect, solar corpuscular radiation

ABSTRACT: In connection with the widely discussed problems of detection of solar neutrinos and the study of the interior structure of the sun, the author considers the possibility of detecting solar neutrinos with the aid of the low-threshold reaction $\text{Ga}^{71}(\nu, e^-)\text{Ga}^{71}$, which makes it possible to register effectively the neutrinos from the reactions $\text{H}^2(p, e^+, \nu)\text{H}^2$ and $\text{Be}^7(e^-, \nu)\text{Li}^7$. The features of this reaction were discussed by the author earlier (Preprint FIAN, A-62, 1964; Izv. AN SSSR v. 29, 1743, 1965). Advantages of this method are a low-energy threshold for neutrino absorption (0.237 Mev), a relatively large cross section for the neutrino absorption by the Ga^{71} nucleus even in the ground state ($\log ft \approx 4.3$), the ease with which Ga^{71} atoms can be chemically separated from large quantities of Ga owing to the large lifetime of the Ga^{71} , and the appreciable abundance of Ga^{71} (~40%). Furthermore, the energy released in Ga^{71} during K capture is much larger than that for K capture in Ar^{37} (~12 vs. ~2.8

Card 1/2

L 12146-66

ACC NR: AP6000211

15
kev), affording a possibility of background discrimination. The cross sections for various reactions between solar neutrinos and various elements on earth are tabulated. It is noted that an important role may be played in neutrino absorption by transitions to the excited states of Ge^{71} . Author thanks S. N. Vernov, N. A. Dobrotin, G. T. Zatsepin, M. A. Markov, and B. M. Pontecorve for interest in the work and useful remarks. Orig. art. has: 1 table.

SUB CODE:0320/ SUBM DATE: 14Jun65/ ORIG REF: 004/ OTH REF: 008

HW
Card 2/2

ACC NR: AP6031341

SOURCE CODE: UR/0386/66/004/003/0114/0117

AUTHOR: Zatsepin, G. T.; Kuz'min, V. A.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Upper limit of the spectrum of cosmic rays ✓

SOURCE: Zh. eksper. i teoret. fiz. Pis'ma v redaktsiyu. Prilozheniye v. 4, no. 3, 1966, 114-117

TOPIC TAGS: cosmic ray intensity, cosmic radiation composition, cosmic dust, cosmology, alpha particle, high energy interaction

ABSTRACT: On the basis of recently observed powerful isotropic thermal radiation of the Universe, having apparently a Planck distribution with temperature $T \approx 3K$, the authors show that if the characteristic time for proton-phonon collision becomes sufficiently small compared with the lifetime of high-energy cosmic rays in the Metagalaxy, as determined by other processes (for example, the expansion of the Universe), then effective cutoff of the cosmic ray spectrum will take place. The characteristic time of collision between a proton of energy $E_p \gg M_{pc}^2$ and a photon is calculated for different proton energies and for several photon gas temperatures ($T = 2, 3, 5, 10$, and 30). The results show that at proton energies $E_p \gtrsim 10^{20}$ ev, proton interactions with the photon gas become quite frequent, $\tau_{py} \approx 10^7$ years. This means that at the age $t \gtrsim 10^8$ of the cosmic rays with energies under consideration, their initial spec-

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ACC NR: AP6031341

trum should be cut off in the high-energy region, even if the acceleration mechanism had been sufficiently effective in producing particles having these energies. The question of the exact form of the cosmic-ray spectrum in the energy region $E_p \gtrsim 10^{19}$ ev calls for a detailed analysis combined with allowance for their generation, the expansion of the Universe, and the interaction of the cosmic rays with the photon gas at each stage of evolution of the Universe. The form of the spectrum will depend on which state of evolution of the Universe the cosmic-ray particles of superhigh energy were generated, and how rapidly the generation took place. It is shown that a study of the energy spectrum of the cosmic rays near its upper limit yields information not only on the processes of their generation, but also on the evolution of the Universe. The influence of the change of the photon-gas temperature T on the position of the limit of the cosmic-ray spectrum and the disintegration of α particles and other nuclei as they pass through metagalactic space are also discussed, and it is deduced from the rather large cross section of the latter process that the nuclei should vanish completely from the cosmic rays at energies above 10^{19} ev. Orig. art. has: 2 figures and 2 formulas.

[02]

SUB CODE: 20/ SUBM DATE: 26May66/ ORIG REF: 002/ OTH REF: 004/ ATD PRESS: 5081

Card 2/2

KUZ'MIN, V., inzh.

A laboratory for radio amateurs. Radio no. 12, 5 D '63. (MIRA 16:3)
(Radio operators) (Radio clubs)

Kuzmin, V. A.

PSURTSEV, N.; KUZ'MIN, V.; DOGADIN, V.; FORTUSHENKO, A., prof.; GUSEV, I.;
BLOKHIN, A., kand. tekhn. nauk

Wealth of the millions. Radio no. 8:4-6 Ag '64. (MIRA 17:11)

1. Ministr svyazi SSSR (for Psurtsev). 2. Nachal'nik Tekhnicheskogo
upravleniya Ministerstva svyazi SSSR (for Kuz'min). 3. Zamestitel'
nachal'nika Glavnogo upravleniya gorodskoy i sel'skoy telefonnoy svyazi
i radiofikatsii (for Degadin). 4. Glavnyy inzh. Glavnogo upravleniya
gorodskoy i sel'skoy svyazi i radiofikatsii (for Gusev).

KUZ'MIN, Vladimir Alekseyevich

PSURTSEV, N.; KUZ'MIN, V.; DOGADIN, V.; FORUSHENKO, A., prof.; GUSEV, I.;
BLOKHIN, A., kand. tekhn. nauk

It was accomplished by millions. Radio no.8:4-6 Ag '65.

(MIRA 18:7)

1. Ministr svyazi SSSR (for Psurtsev). 2. Nachal'nik Tekhnicheskogo
upravleniya Ministerstva svyazi SSSR (for Kuz'min). 3. Zamestitel'
nachal'nika Glavnogo upravleniya gorodskoy i sel'skoy telefonnoy
svyazi i radiofikatsii (for Dogadin). 4. Glavnyy inzh. Glavnogo
upravleniya gorodskoy i sel'skoy telefonnoy svyazi radiofikatsii
(for Gusev).

L 56042-65 EWT(d)/T Pg-4/Pn-4 Jp(c)
ACCESSION NR: AT5014620 UR/2562/61/000/013/0075/0096

AUTHOR: Kuz'min, V. A. (Moscow) 19
BT/

TITLE: Realization of the functions of algebraic logic by automata, normal algorithms, and Turing machines 16

SOURCE: Problemy kibernetiki, no. 13, 1965, 75-96

TOPIC TAGS: algebraic logic, function realization, normal algorithm, Turing machine, Mealy Trachtenbrot automaton, control theory

ABSTRACT: The author studied the realization of the functions of algebraic logic in n variables by three classes of control systems: the normal algorithms constructed by A. A. Markov (Izv. MIAN SSSR, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 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2787, 2788, 2789, 2790, 2791, 2792, 2793, 2794, 2795, 2796, 2797, 2798, 2799, 2800, 2801, 2802, 2803, 2804, 2805, 2806, 2807, 2808, 2809, 2810, 2811, 2812, 2813, 2814, 2815, 2816, 2817, 2818, 2819, 2820, 2821, 2822, 2823, 2824, 2825, 2826, 2827, 2828, 2829, 2830, 2831, 2832, 2833, 2834, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843, 2844, 2845, 2846, 2847, 2848, 2849, 2850, 2851, 2852, 2853, 2854, 2855, 2856, 2857, 2858, 2859, 2860, 2861, 2862, 2863, 2864, 2865, 2866, 2867, 2868, 2869, 2870, 2871, 2872, 2873, 2874, 2875, 2876, 2877, 2878, 2879, 2880, 2881, 2882, 2883, 2884, 2885, 2886, 2887, 2888, 2889, 2890, 2891, 2892, 2893, 2894, 2895, 2896, 2897, 2898, 2899, 2900, 2901, 2902, 2903, 2904, 2905, 2906, 2907, 2908, 2909, 2910, 2911, 2912, 2913, 2914, 2915, 2916, 2917, 2918, 2919, 2920, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929, 2930, 2931, 2932, 2933, 2934, 2935, 2936, 2937, 2938, 2939, 2940, 2941, 2942, 2943, 2944, 2945, 2946, 2947, 2948, 2949, 2950, 2951, 2952, 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3783, 3784, 3785, 3786, 3787, 3788, 3789, 3790, 3791, 3792, 3793, 3794, 3795, 3796, 3797, 3798, 3799, 3800, 3801, 3802, 3803, 3804, 3805, 3806, 3807, 3808, 3809, 3810, 3811, 3812, 3813, 3814, 3815, 3816, 3817, 3818, 3819, 3820, 3821, 3822, 3823, 3824, 3825, 3826, 3827, 3828, 3829, 3830, 3831, 3832, 3833, 3834, 3835, 3836, 3837, 3838, 3839, 3840, 3841, 3842, 3843, 3844, 3845, 3846, 3847, 3848, 3849, 3850, 3851, 3852, 3853, 3854, 3855, 3856, 3857, 3858, 3859, 3860, 3861, 3862, 3863, 3864, 3865, 3866, 3867, 3868, 3869, 3870, 3871, 3872, 3873, 3874, 3875, 3876, 3877, 3878, 3879, 3880, 3881, 3882, 3883, 3884, 3885, 3886, 3887, 3888, 3889, 3890, 3891, 3892, 3893, 3894, 3895, 3896, 3897, 3898, 3899, 3900, 3901, 3902, 3903, 3904, 3905, 3906, 3907, 3908, 3909, 3910, 3911, 3912, 3913, 3914, 3915, 3916, 3917, 3918, 3919, 3920, 3921, 3922, 3923, 3924, 3925, 3926, 3927, 3928, 3929, 3930, 3931, 3932, 3933, 3934, 3935,

L 56942-65

ACCESSION NR: AT5014620

work." Orig. art. has: 86 formulas and 3 figures.

ASSOCIATION: None

SUBMITTED: 23Aug63

ENCL: 00

SUB CODE: MA, DP

NO REF SOV: 005

OTHER: 003

Card

2/2

ACCESSION NR: AP5014879

UR/0142/65/008/002/0165/0170
621.382.333.33

AUTHOR: Kuz'min, V. A.; Mochalkina, G. R.

TITLE: Effect of current on gain in p-n-p-n devices

SOURCE: IVUZ. Radiotekhnika, v. 8, no. 2, 1965, 166-170

TOPIC TAGS: pnpn diode, four region diode, thyristor

ABSTRACT. These results of an experimental and theoretical investigation of the four-region silicon diode are reported.

It was established that the current derivative may be neglected in the estimation of the switching voltage if the current density in the forward region is small compared with the current density in the reverse region.

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ACCESSION NR: AP5014879

the relation $\frac{\partial a}{\partial I} \neq 0$, but $\bar{a} + \frac{\partial \bar{a}}{\partial I} \approx \bar{a}_{\max}$; hence, in this current range, the current derivative, too, has no effect on the junction voltage; (3) With the breakdown voltage. Orig. art. has: a figure and formula.

ASSOCIATION: none

SUBMITTED: 07Oct64

ENCL: 00

SUB CODE: EC

NO REF SOV: 000

OTHER: 000

Card 2

KUZ'MIN, V.A.

Response time of a transistor with a wide base. Radiotekh. i
elektron. 10 no.5:966-968 My '65. (MIRA 18:5)

KUZ'MIN, V.A.; MOCHALKINA, O.R.

Current dependence of the amplification factors of p-n-p-n- devices.
Izv. vys. ucheb. zav.; radiotekh. 8 no.2:165-170 Nov-Apr '65.
(MIRA 18:7)

L 37680-66 REC(k)-2/EMT(1)/T LJP(c) GD

ACC NR: AT6022325

SOURCE CODE: UR/0000/66/000/000/0014/0020

AUTHOR: Kuz'min, V. A.; Pershenkov, V.S.

ORG: none

49

B+1

TITLE: Turn-on transients in p-n-p-n controllable diodes 25

SOJRCCE: Vsesoyuznaya nauchnaya sessiya, posvyashchennaya Dnyu radio. 22d, 1966.
Sektsiya mikroelektroniki. Doklady. Moscow, 1966, 14-20

TOPIC TAGS: semiconductor diode, avalanche diode, controllable diode

ABSTRACT: The T. Misawa theoretical and experimental work (J. of El. and Control, 1959, no. 6, p 523) is praised; further investigations of a p-n-p-n structure by these authors are reported. A simple formula for the current-rise time, in terms of the time constant, gain, etc., is developed. An experimental plot of current-rise time vs. voltage is shown; n-base resistivity, 30 ohms.cm; n-base thickness, 130 μ ; time constant, 3 μ sec; transfer factor, 0.5. It is found that: (1) The turn-on current-rise time can be calculated, with sufficient accuracy, on the basis of the p-n-p transistor component only; (2) Allowance for the modulation of wide-base thickness permits evaluating the rise-time / collector-voltage relation; (3) The effect of avalanche multiplication on the rise time is very small for voltages up to 400 v; (4) At higher voltages, the rise time can be reduced down to a fraction of one microsecond. Orig. art. has: 3 figures and 15 formulas. [03]

SUB CODE: 09 / SUBM DATE: 05Apr66 / ORIG REF: 001 / OTH REF: 002

Card 1/1

L 02407-67 EWT(1) GD

ACC NR:

AT6022324

SOURCE CODE: UR/0000/66/000/000/0009/0014

AUTHOR: Vaganov, V. I.; Kuz'min, V. A.; Per shenkov, V. S.; Shagurin, I. I. 73
B+1

ORG: None

TITLE: Possibilities for using thyristors in low-voltage pulse circuits

SOURCE: Vsesoyuznaya nauchnaya sessiya, posvyashchennaya Dnyu radio. 22d, 1966. Sektsiya mikroelektroniki. Doklady. Moscow, 1966, 9-14

TOPIC TAGS: thyatron, semiconductor device, pulse generator, flip flop circuit, microelectric circuit

ABSTRACT: The authors consider the properties of the thyristor, a semiconductor device with S-shaped voltage-current characteristics, and discuss the possibilities for using these devices in low-voltage microelectronic pulse circuits. A theoretical and experimental analysis of the equivalent circuit for the thyristor shows that the output reactance of the device is a frequency dependent nonlinear inductance. Flip-flop circuits based on series-parallel connection of dynistors and diodes are discussed. These circuits eliminate the disadvantages inherent in a simple dynistor flip-flop, i. e. a considerable increase in the input impedance of the circuit when the dynistor is open, and are also considerably simpler than transistorized flip-flops, although they have fewer logi-

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L 02407-67

ACC NR:

AT6022324

cal possibilities and are also subject to considerable disadvantages associated with the complexity of matching. A detailed analysis of the simplest trinistor flip-flop (a trinistor in series with a resistor) shows that it is considerably simpler than the corresponding transistorized circuit and does not have the disadvantages shown by dynistor flip-flops, but still has fewer logical possibilities than circuits with transistors. Two flip-flop circuits based on series-parallel combination of trinisitors and transistors show appreciable advantages over simple transistor circuits. An analysis of the possibilities for using trinisitors in functional logic circuits shows that they have the advantage of forming the front for the output signal independently of the rise time of the input signal, although the greater complexity of trinistor circuits makes them less promising than transistorized logic elements at the present time. Sawtooth generators based on trinisitors are extremely simple and give a nonlinearity of less than 1% in the output voltage. An experimental investigation of tetristor flip-flops shows that the dynamic properties of these circuits are completely determined by tetristor parameters and are nearly independent of other circuit properties. A method is proposed for direct matching of flip-flops based on thyristors. Analysis of experimental data shows that the most promising fields for use of thyristors in microelectronic circuits are storage devices, high-power pulse shapers and oscillator circuits. The thyristor with best prospects for development is the tetristor and thyristor-transistor combinations have definite possibilities.

SUB CODE: 09/ SUBM DATE: 05Apr66
Card 2/2

ACC NR: AP7002664

SOURCE CODE: UR/0109/67/012/001/0070/0075

AUTHOR: Kuz'min, V. A.; Pershenkov, V. S.

ORG: none

TITLE: Transient switching process in a controlled p-n-p-n diode

SOURCE: Radiotekhnika i elektronika, v. 12, no. 1, 1967, 70-75

TOPIC TAGS: switching theory, transistor, electronic switch, *junction diode, pn reaction*

ABSTRACT: A simple, experimentally verified theory, concerning the switching process of a controlled p-n-p-n diode is proposed. The inertial properties of a transistor with a wide base are taken into account, and an expression for current rise time (t_f) which reflects the dependence of switching time on the physical parameters of the device is derived. It is shown that t_f is reduced by a factor of 2-3 and reaches 0.2-0.3 μ sec when the collector voltage is increased from 100 to 400 v. Orig. art. has: 4 figures and 5 formulas. [WP]

SUB CODE: 09, 20/ SUBM DATE: 20Aug65/ ORIG REF: 004/ OTH REF: 004

Card 1/1

UDC: 621.382.233.064.1.001.5

KOLYAGO, S.A.; KUZ'MIN, V.A.

Problems of soil geography at the Eight International Congress of
Soil Scientists in Bucharest. Dokl. Inst. geog. Sib. i Dal'. Vost.
no.7:85-90 '64.
(MIRA 18:10)

KUZ'MIN, V.A.; SAZONOV, A.G.

Podzolic soils in the Chara Trough (northern Transbaikalia).
Pochvovedenie no.11:11-20 N '65. (MIRA 18:12)

1. Institut geografii Sibiri i Dal'nego Vostoka. Submitted
June 14, 1964.

COUNTRY : USSR
CATEGORY :

M-4

ABS. JOUR. : RZBiol., No. 19, 1958, No. 37028

AUTHOR : Kuz'min, V. D.

INST. :

TITLE : Should Corn be Pruned to a Single Stalk in Southeastern Areas.

ORIG. PUB. : S. kh. Povolzh'ya, 1957, No 2, 40-43

ABSTRACT : Relying upon data of many experiment installations of the Southeast, secured during 1923-1930, and also on the basis of tests conducted during recent years at the Agricultural Institute of the Southeast, and its affiliates, the author reports that it is useless to cut off secondary stems in any plantings of corn, since this procedure does not increase grain yields, decreases as a rule the yield of green feed, and involves much additional work. Only in individual instances can pruning to a single stalk result in a somewhat higher yield, in southeastern areas, during particularly droughty years.

Yu. L. Gusev.

CARD: 11

USSR/Cultivated Plants - Fodders.

M

Abs Jour : Ref Zhur Biol., No 12, 1958, 53677

Author : Filatov, F.I., Kuz'min, V.D.

Inst : -

Title : What Did the Experimental Sowings of Sorghum japonicum in 1956 in the Saratovskaya Oblast' Show?

Orig Pub : S. kh. Povolzh'ya, 1957, No 5, 46-49

Abstract : The trials of Sorghum japonicum on the Sovkhozes (state farm) of the most arid parts of the Oblast' showed its very late maturity in comparison with sorghum (Sorghum unlgare). The best result was obtained by wide-row planting. At that time the yield of the green bulk was 168 cwt/ha. This did not surpass the yield of Chinese sugar cane (S. saccharatum) which is more valuable from the standpoint of feed quality. -- I.N. Zaikina

Card 1/1

USSR/Cultivated Plants. Grains.

M

Abs Jour: Ref Zhur-Biol., No 5, 1958, 20290.

Author : V.D. Kuz'min.

Inst : Not given.

Title : Experiments in the Mixed Sowing of Corn.
(Opyty smeshannykh posevov kukuruzy).

Orig Pub: S. Kh. Povolzh'ya, 1957, No 9, 49-51.

Abstract: No abstract.

Card : 1/1

BIBIKOV, Yuriy Stepanovich, inzh.; LEMTYUGOV, Vladimir Ivanovich,
inzh.; RUSAK, Aleksandr Matveyevich, inzh. [deceased];
SAVVIN, Igor' Dmitriyevich, inzh.; TAGUNOV, Nikolay
Mikhaylovich, inzh.; FILATOV, Vyacheslav Ivanovich, inzh.;
KUZ'MIN, V.D., kand. tekhn. nauk, red.

[The TGM1 diesel locomotive] Teplovoz TGM1. Moskva, Trans-
port, 1965. 207 p. (MIRA 18:12)

1. Muromskiy zavod imeni F.E.Dzerzhinskogo (for all except
Kuz'min).

KUZ'MIN, Vasilii Fedorovich; MARKOVA, S.M., red.; KAYDALOVA, M.D.,
tekh., red.

[Soybean is our wealth] Soia - nashe bogatstvo. Khabarovsk,
Khabarovskoe knizhnoe izd-vo, 1962. 11 p. (MIRA 16:6)

1. Upravlyayushchiy I otdeleniyem Lazovskogo sovkhoza,
Khabarovskiy kray (for Kuz'min).
(Khabarovsk Territory--Soybean)

KUZMIN, V.F., RUBCHINSKIY, S.M., VASILYEV, A.A., ZILDOVICH, A.P.,
KUROCHKIN, S.S. (U.S.S.R.)

Measurements of the instantaneous values of the
dynamic characteristics in proton synchrotrons

CERN-Symposium on High Energy Accelerators and Pion
Physics

Geneva 11-23 June 56
In Branch #5

KUZMIN, V. F.

"On Measuring the Instantaneous Frequency of Frequency-Modulated Oscillations," by S. M. Rubchinskiy, A. A. Vasil'yev, V. F. Kuz'min, and N. I. Fedorenko, Radiotekhnika i Elektronika, No 7, Jul 56, pp 986-1000

Four methods for precision measurement of the instantaneous frequency of frequency-modulated oscillations were considered. It was proved that the four methods employed in the construction of the 10 Bev synchrophasotron, the selectivity method, the stroboscope method, the two-channel heterodyne method, and the phase method, all possessed accuracies better than $\pm 5 \times 10^{-4}$.

SYM-1305

ANISONYAN, A.A.; KUZ'MIN, V.F.

Production of a mixture of CO and H from natural gas
by oxygen conversion under pressure. Gaz. prom. 4 no.3:
34-39 Mr '59. (MIRA 12:5)
(Water gas) (Gas, Natural)

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S/120/60/000/005/009/051
E192/E382

AUTHORS: Kuz'min, V.F. and Matyukhin, S.S.

TITLE: Fast Electronic Counter with a Printer Unit

PERIODICAL: Pribery i tekhnika eksperimenta, 1960, No. 5,
pp. 46 - 52

TEXT: A block diagram of the instrument is shown in Fig. 1. The device consists of the following elements:
1 - frequency multiplier; 2 - frequency generator;
3 - printer unit; 4 - forming or shaping circuit;
5 - electronic switch; 6 - counting device; 7 - control circuit; 8 - timer circuit; 9 - standardising circuit;
10 - another forming circuit; 11 - selection circuit and 12 - control circuit. If it is necessary to measure the frequency f_x of a source, the measured waveform is applied to the first^x shaping circuit which produces sharp pulses at its output; the pulses are repeated at the frequency f_x . The pulses are applied to the electronic switch which is normally closed. The state of this switch is determined by the control trigger circuit. During the measurements

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Fast Electronic Counter with a Printer Unit

the trigger circuit is opened for the duration τ by the timer circuit and this results in the opening of the electronic key. After the time interval τ a second pulse is applied to the trigger circuit and this results in the closing of the electronic switch. During the interval τ the pulses from the forming circuit are applied to the counter, where their number is recorded. The unknown frequency $f_x = n/\tau$ where n is

the number of pulses registered by the counter. The instrument can have four values, 0.01, 0.1, 1.0 and 10 sec. The error in the frequency measurement depends on the frequency instability of the standard crystal oscillator, the delays in the operation of the interval timer and the time of arrival of the input pulses with regard to commencement and termination of the keying pulses. Assuming that the conditions are an optimum the minimum relative error in the measurement of the frequency of 10 Mc/s is $\pm 10^{-7}$. However, this accuracy can

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only be obtained if the instability of the frequency standard is less than $\pm 10^{-7}$. The instrument uses a thermostatically controlled quartz oscillator of the Clapp type, operating at 1 Mc/s. The instability of this device is $\pm 10^{-7}$ per week. The 1 Mc/s frequency was chosen as the standard because the available 1 Mc/s crystal gave the best stability. A detailed circuit diagram of the oscillator is shown in Fig. 2. The output waveform of the oscillator is applied to a Schmitt trigger having a hysteresis of about 3 V. In the measurement of the time intervals between two input pulses, the standard frequency (multiplied by 10) is applied to the forming circuit, while the two pulses are applied to the control trigger. The pulses are suitably shaped by the standardising circuit (Fig. 1). The error in the measurement is again determined by the same factors as in the frequency measurements. If it is necessary to measure the period of a waveform this is applied to the second forming circuit, whose action is analogous to that of the first forming circuit. Now the selector circuit

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singles out two pulses from the resulting pulse train. The pulses are applied to the standardising circuit and then to the control trigger circuit. The interval timer circuit is based on a frequency divider consisting of 7 phantastrons, a time selector, an electronic switch and a switching trigger circuit. A detailed circuit diagram of a phantatron divider is shown in Fig. 3. The division ratio of the circuit is 10 and its delay time is 0.1 μ s. The pulse-forming circuit is shown in Fig. 4, together with the electronic switch and the control trigger circuit. The electronic switch is based on a pentode, where the control signal is applied to the third grid, the magnitude of this signal being not less than 10 V. The control trigger is in the form of a symmetrical binary circuit. This is based on two pentodes having a very high slope. The transition time of the electronic switch is less than 50 nps. The actual forming circuit consists of a wide-band amplifier (having a bandwidth from 10 cps to 12 Mc/s), a Schmitt trigger based on two pentodes and an amplifying

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stage connected to the output of the electronic switch. The instrument is furnished with a counter consisting of 8 decades. Each decade is built from 4 binary circuits based on pentodes. A detailed diagram of a binary is shown in Fig. 5. Four binaries are so arranged, by providing suitable feedback paths, that they are capable of recording 10 pulses before returning to their rest position. From Fig. 5 it is seen that the cathode of each tube in the decade is provided with a 150 ohm resistor. This is used in the oscillographic observation of the operation of the circuit and for driving the reading circuit. The indication of the state of a decade is effected by a reading circuit consisting of 10 junction transistors. These are connected as grounded-emitter circuits and they contain small lamps in their collectors. By using the lamps it is possible to read the count under normal daylight illumination conditions. Further, the voltage drop across the lamps is used for printing a suitable digit on the printer unit. The instrument consists of two separate units situated in the same cabinet, having

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dimensions of 600 x 500 x 400 mm³. One of the units contains all the supplies, while the other houses all the remaining elements. The printer unit is based on the printer from the tabulating machine, type T-4M. The overall power consumption of the instrument is 430 W and its weight is 55 kg. The device has a resolving time of 0.07 μ s and has the following measurement ranges: 1) 10 cps to 12 Mc/s for frequency; 2) 1 μ s to 100 days for time and 3) 100 μ s to 0.1 sec for measuring the periods of frequency waveforms. The authors express their gratitude to S.M. Rubchinskiy for valuable advice and his constant interest in this work and to R.K. Titov, Yu.D. Bol'shakov and E.A. Knorin for participation in the construction of the instrument. There are 7 figures and 4 references: 1 Soviet and 3 English. ✓

ASSOCIATION: Radiotekhnicheskiy institut AN SSSR (Radio-
engineering Institute of the AS USSR)

SUBMITTED: September 19, 1959
Card 6/6

KUZMIN, V. F.

10738

S/120/62/000/004/003/047
E140/E420

AUTHORS: Rubchinskiy, S.M., Batskikh, G.I., Vasil'yev, A.A.
Vodop'yanov, F.A., Gutner, B.M., Kuz'min, A.A.,
Kuz'min, V.F., Lebedev-Krasin, Yu.M., Uvarov, V.A.

TITLE: The electronic system of the 7 Gev proton synchrotron

PERIODICAL: Priory i tekhnika eksperimenta, no.4, 1962, 20-26

TEXT: The article surveys the electronic system of the 7 Gev proton synchrotron, the individual parts of which are described in individual articles in the same number of the journal. The electronic circuits control the continuous increase of the energy of the accelerated particles. For the chamber aperture used in the apparatus, the deviation of the momentum from the equilibrium value cannot exceed $\pm 5 \times 10^{-3}$. The instantaneous values of H must be held to within 10^{-3} at the start ($f = 0.67$ Mc/s) and 5×10^{-5} at the end of the acceleration cycle ($f = 8.31$ Mc/s). The synchrotron frequency varies from 3600 to 130 c/s. To keep the oscillations of phase with passage through resonance less than the adiabatic damping of these oscillations, the harmonic frequency modulation of the accelerating potential by the synchrotron frequency should not exceed 0.5 c/s and the harmonic amplitude

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The electronic system of ...

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of the modulation at the same frequencies should be less than 2×10^{-4} at the start and 5×10^{-3} at the end of the cycle. The spectral density of noise modulation should be of the order of 2×10^{-3} cs²/cs. The precision of measuring H at the instant of injection was prescribed as 3×10^{-4} . These requirements are met by a programmed frequency control with correction for the radial and phase positions of the beam, calculated for beam intensities of 10^8 to 10^{12} particles. The beam measuring system consists of a precise discrete integrator and a meter for the initial level of the magnetic field intensity. Special equipment is required for the automatic measurement of the instantaneous values of frequency and field intensity, the measurement of micromodulation of the frequency and amplitude of the accelerating potential, variations of beam intensity over the acceleration cycle, the azimuthal distribution of particle density in the bunch, and the position of the beam in the vacuum chamber. An overall block diagram of the system is given and also summary descriptions of the systems for generating the accelerating field, the acceleration control and the measuring equipment. The
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The electronic system of ...

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E140/E420

particles are accelerated at the seventh harmonic of their frequency of revolution - in the band from 0.67 to 8.31 Mc/s. The energy increase is 4.3 keV per revolution. The accelerating elements are 2.4 m drift tubes located in 11 compensating electromagnets. The transit angle in each tube is about 25° and the ratio of accelerating potential to the potential across the tube is about 0.43. The system ensures a phase oscillation of the beam below 0.05 r and stabilizes the radial position to within ± 1 mm. There is 1 figure. ✓

ASSOCIATION: Radiotekhnicheskiy institut GKAE
(Radio Engineering Institute GKAE)

SUBMITTED: April 23, 1962

Card 3/3

S/120/62/000/004/021/047
E192/E382

AUTHORS: Kuz'min, V.F. and Rubchinskiy, S.M.
TITLE: System of automatic radio measurements on the
7 GeV proton synchrotron
PERIODICAL: Priory i tekhnika eksperimenta, no. 4, 1962,
115 - 118
TEXT: The accuracy of the functional relationship between
the frequency f of the accelerating field and the magnetic
field H of the proton synchrotron should be 10^{-3} at the
commencement and 8×10^{-5} at the end of the acceleration cycle.
The functional relationship between f and H is checked
at 5 fixed points of the acceleration cycle. Automatic equip-
ment, whose block diagram is shown in the figure, is used for
this purpose. The equipment consists of: 1 - a precision
frequency meter; 2 - memory device; 3 and 6 - recorders;
4 - precision voltage comparator; 5 - electronic msec meters
and memory devices for U and 7 - a uniselector. The
deviations of the instantaneous frequency f from the nominal
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System of automatic

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value is measured by the frequency meter 1, which is based on the measurements of a time interval τ during which the phase of the controlled frequency-modulated signal changes by a predetermined angle φ . The deviations $\Delta\tau$ of the measured time interval τ from the nominal value τ_0 is measured in order to determine the frequency deviation Δf . The stability of the frequency-programmer elements is checked by measuring the instantaneous value of the integrator output U_i and the functional converter output U_{fn} (V.A. Uvarov, PTE, no. 4, 1962, 89). Measurement of these signals is performed by an accurate voltage comparator which produces an output pulse at the instant when the controlled voltage and the standard comparator become equal. The control of all the elements of the automatic-measurement system is effected by means of the uniselector 7, which is advanced one step by the pulse produced at the end of each acceleration cycle. There are 1 figure and 3 tables.

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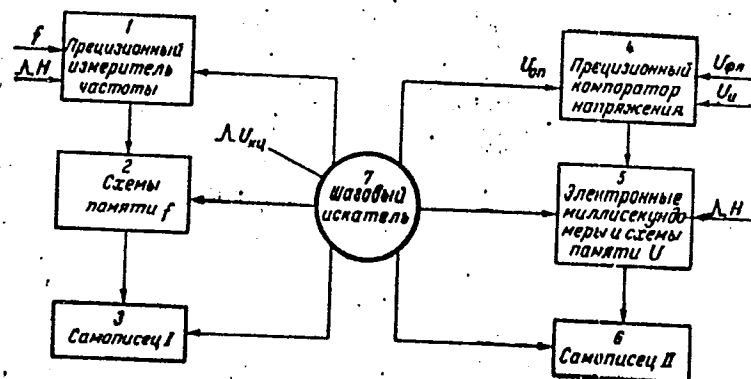
System of automatic

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ASSOCIATION: Radiotekhnicheskiy institut GKAE
(Radio-engineering Institute, G.K.A.E)

SUBMITTED: April 6, 1962

Figure



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L 43088-65 EWT(m)/ EPA(w)-2/EWA(m)-2 Pab-10/Pt-7 IJP(c) JT/GS
 5/0000/64/000/000/0197/0201
 ACCESSION NR: AT5007918

AUTHOR: Vladimirskiy, V. Y.; Gol'din, L. L.; Koshkarov, D. G.; Tarasov, Ye. K.;
 Yakovlev, B. M.; Gustov, G. K.; Komar, Ye. G.; Kulikov, V. V.; Malyshev, I. F.;
 Monoszon, N. A.; Popkovich, A. V.; Stolov, A. M.; Strol'tsov, N. S.; Titov, V. A.;
 Vodop'yanov, F. A.; Kuz'min, A. A.; Kuz'min, V. F.; Mints, A. L.; Rubchinskiy,
 S. M.; Uvarov, V. A.; Zhdanov, V. M.; Filaretov, S. G.; Shirvayev, F. Z.

TITLE: 60-70 GeV Proton Synchrotron

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy.
 Moscow, Atomizdat, 1964, 197-201

TOPIC TAGS: high energy accelerator, synchrotron

ABSTRACT: A 60-70 GeV proton synchrotron with strong focusing is being constructed
 not far from Serpukhov, as has been reported earlier (e.g. "Research Institute for
 Electro-Physical Equipment, Leningrad," in Proceedings of the International Confer-
 ence on High Energy Accelerators and Instrumentation (CERN, 1959), p. 373). The
 present report describes parameter changes and improvements in precision structural
 characteristics of the accelerator, and the present state of construction in mid-
 1963. The parameters of the magnet are presented in a table. A small change in
 the original plans permitted an increase in the length of a part of the free
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